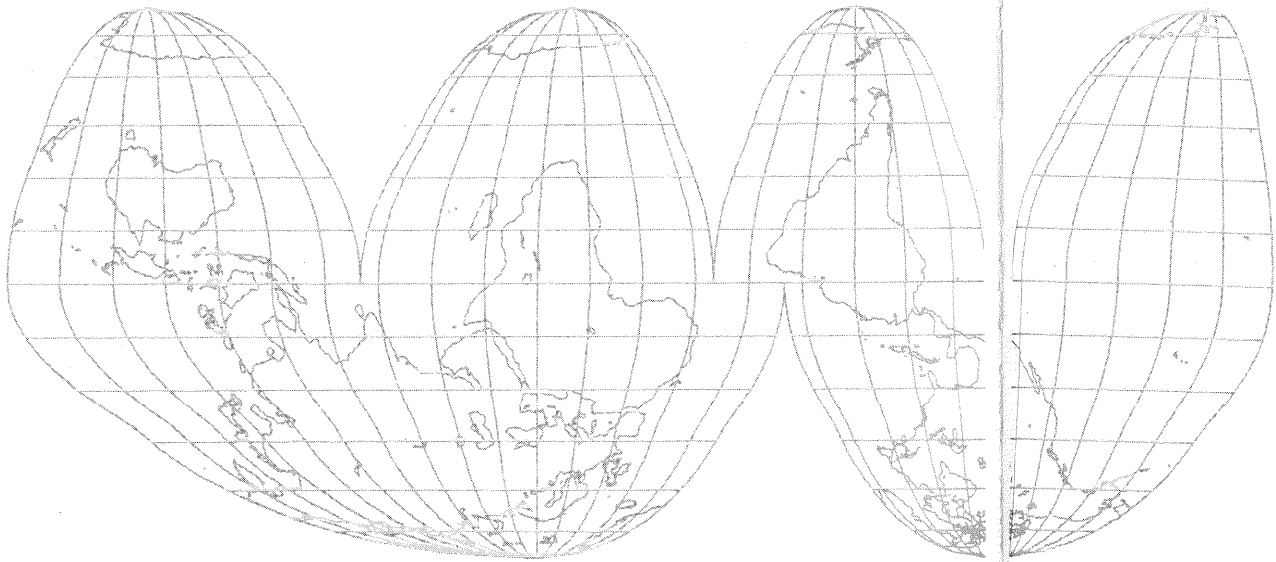


Maps and Politics

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The University of Chicago Press



2 Mapping the World and its Peoples

At the global level, the first and most obvious cause of contention about mapping is that of projection. This has to involve distortion: a projection is a flat (two-dimensional) representation of the globe and the (three-dimensional) curved globe is not flat. There can be no such thing as a 'correct shape' on a map projection, not least because maps have 'cuts', which occur along the edge of the map.

The most common representations of the world are rectangular. This reflects the nature of modern printing: the appropriateness of such images for the atlas page or double page and the extent to which single-sheet documents, whether maps or otherwise, are generally rectangular (as are computer screens). However, rectangular maps deprive the world of its circularity: they make each parallel and meridian appear as straight, instead of circular, and give the globe the misleading visual character of right-angle corners and clear edges. The very need to choose a projection emphasizes the degree to which choice is involved in the representational nature of maps.

A number of different projections have been produced over the centuries, to serve different purposes. The most influential, and the only ones to be adopted by 'developed', i.e. Europeanized, societies around the world, have been European. The world was first circumnavigated in the sixteenth century, and by Europeans. It is not surprising that many of the maps they then produced used a projection that made most sense in terms of the employment of the compass, and of maritime directions and links, especially in the mid-latitudes. Europeans needed to be able to sail great distances if they were to fulfil the commercial logic of distant possessions and trading opportunities.

In 1569, the Fleming Gerardus Kramer, Latinized as 'Mercator' (1512–94), produced a projection that treated the world as a cylinder, so that the meridians were parallel rather than converging on the poles. The poles were expanded to the same circumference as the Equator, greatly magnifying temperate land masses at the expense of tropical ones. Taking into account the curvature of the Earth's surface, Mercator's projection

niques are difficult to assess,³⁵ certainly, the bold arrows that might be used to indicate influences on modern maps are inappropriate. However, it appears that Chinese advances such as printing by engraving on wood blocks were adopted by Islamic traders and thence passed to Europe. The Mediterranean world had witnessed significant advances in cartographic understanding, activity and techniques during the Classical period, but, thereafter, much of the knowledge was lost. Ptolemaic cartography was re-

discovered in the same period as Chinese techniques spread.

Both the chronology and the pattern of developments and influences are obscure and have been differently interpreted. What is certainly clear, however, is that the Western cartographic project of the last half-millennium, with its Eurocentric assumptions and its relationship with the spread of European power, drew to a degree on Chinese roots. As with China, knowledge and interest combined to ensure that the resulting cartography had a particular focus; in the case of China, that of China and its immediate neighbours, the latter being understood and presented in relation to China.

Definitions of maps and understandings of cartography both involve issues of power. Politics stands as a metaphor for social processes that provide the context for cartography and mould much of its content and reception. Although some of the more strident claims about the role of power in cartography and of cartography in power can be queried, it is, nevertheless, the case that such issues should play an important role in discussion about the contents and purposes of maps.

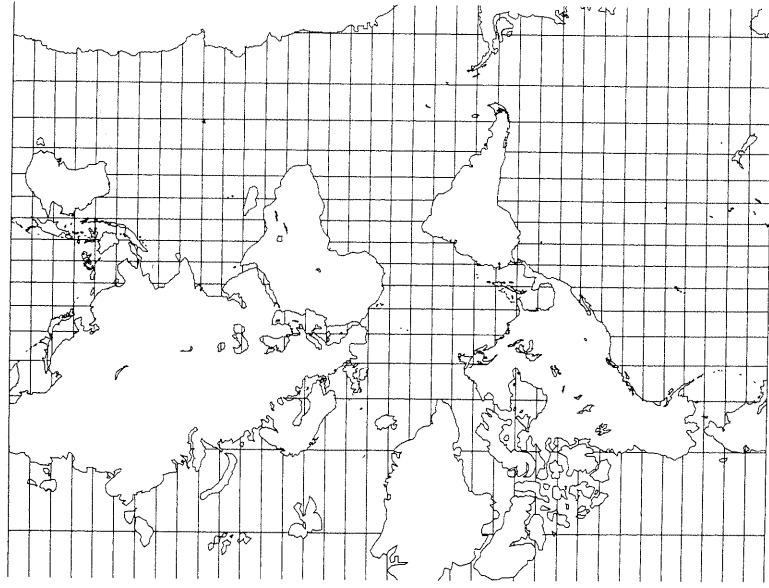
Mercator placed Europe at the top centre of his map, not of his projection: a Mercator projection might just as easily have the North Pacific in its top centre, with Europe split between left and right extremes; and it might just as well have the south at the top.

Mercator's is sometimes treated as the archetypal European projection. This is misleading, because, influential as it was and is, there was in fact some variety in the projections employed, although the notion of Europe as central and the northern hemisphere as on top was preserved. An equal-area projection was described by Johann Heinrich Lambert in 1772, and another in 1855 by the Scottish clergyman James Gall. Other early examples were those of Sanson-Flamsteed and Mollweide.

Yet concern with maritime routes and familiarity with projections of the Mercator type encouraged an essential conservatism in presentation, not least because one alternative, an equal-area projection, developed by J. Paul Goode in the 1920s, required cuts not only at the margins but also in the oceans,¹ and there was a cultural preference for flattening the globe onto a two-dimensional shape without any obvious joins or cuts except at the margins. However, in principle, a rectangular, circular or elliptical map is just as much cut as the kind of interrupted projection that is offered by a world map in two hemispheres, on which the cuts are very obvious.

The Van der Grinten projection, invented in 1898, continued the Mercator projection's practice of exaggerating the size of the temperate latitudes.² Thus Greenland, Alaska, Canada and the USSR appeared larger than they in fact were. This projection was used by the American National Geographic Society from 1922 until 1988; as such, it was very influential. The Society's maps were the staple of educational institutions, the basis of maps used by newspapers and television, and the acme of public cartography, for the period when the USA was the most powerful nation in the world, and, because earlier versions of maps enjoy a long life even when there has been a new and different edition, the influence of the Van der Grinten projection will long continue. In that projection a large USSR appeared menacing, a threat to the whole of Eurasia, and a dominant presence in the world that required containment. It was a cartographic image appropriate for the Cold War.

The geopolitical menace was abruptly reduced in the Robinson projection adopted by the National Geographic Society in 1988.³ This offered a flatter, squatter world that was more accurate in terms of area. Thus, the Soviet Union moved from being 23 per cent larger than what the public was told it 'really is' – in the Van der Grinten projection – to being only 18 per cent more; Greenland from 554 per cent more to 60 per cent; Canada from 258 per cent to 21 per cent more; and the USA – further south than most British people appreciate – from 68 per cent more to 3 per cent less.



A world safe for sailors: a modern outline reconstruction of the 1569 map developed by Gerardus Mercator.

kept angles and thus bearings accurate in every part of the map, so that a straight line of constant bearing could be charted across the plane surface of the map, a goal that was crucial for navigation. However, to do so, the scale was varied and thus size was distorted. Strictly speaking, Mercator is not a world projection: in its equatorial (as opposed to transverse or oblique) case, the poles are unshovable, because they would be infinitely large.

However, this was not a problem for European rulers and merchants keen to explore the possibilities provided by exploration and conquest in the middle latitudes to the West (America) and to the East (South Asia). The Mercator projection highlighted the imperial world of Portugal and Spain, and was an appropriate pre-figuring of the Spanish success under Philip II in creating the first global empire: the first empire on which the sun literally never set.

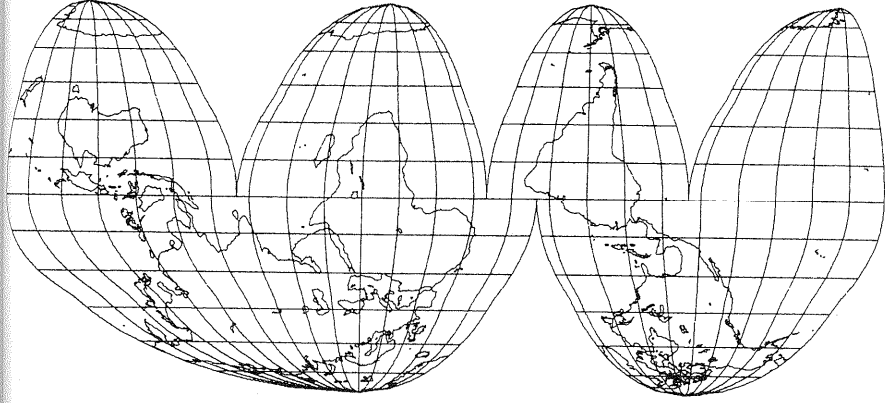
Unlike medieval Christian maps, the Mercator world was not centred on Jerusalem. Mercator placed Europe, which, to a European, both seemed most important and could be mapped most readily, at the top centre of his map, and gave the northern hemisphere primacy over the southern, both by treating the north as the top and by giving the southern less than half the map. However, a Mercator projection need not necessarily include more of the northern hemisphere than the southern. Similarly,

This last example can be seen as a piece of humility, as the product of a determination to lessen the extent to which the USSR outpaces the USA, or as the consequence of a Americo-centred cartography in which it was essential to create a projection that among the major states distorted the USA least. The variety of possible explanations, which can indeed be extended, reflects the difficulty of assessing causality in cartographic change. Arthur Robinson, a prominent academic geographer who had earlier been in charge of mapping at the American Office of Strategic Services during World War Two, had devised his projection in 1963, but it was not widely adopted until a quarter-century later.

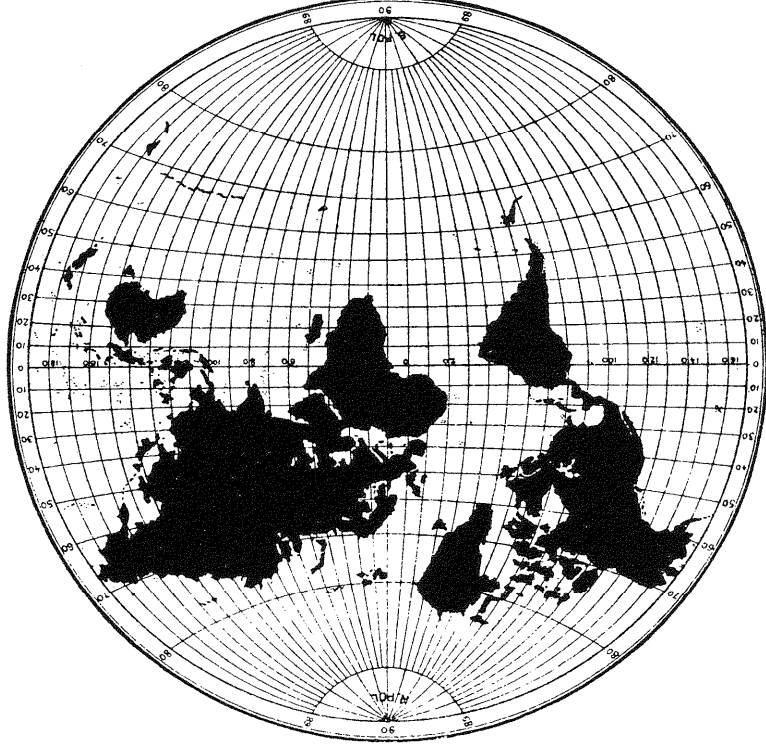
The notion of map space as larger or smaller than a country really is reflects a widespread confusion. Of course, all maps are smaller than a country, and it is only in a work of fiction by Jorge Luis Borges that a map of the Empire that was of the same scale as the Empire can be envisaged. If a projection is considered to be a transformation of a globe, then the 'real' scale (sometimes called the principal scale) of the resulting map is the scale of whichever globe you start with. Thus, to take the case of the Soviet Union, the real meaning in the last paragraph is 23 per cent larger than on a globe with the same principal scale. This, unfortunately, is cumbersome and to most readers incomprehensible, and it is easy to misunderstand why such a form was, and is, not used. However, there was, and is, no excuse for another misleading change used to increase comprehension. Press discussion of the shift sometimes referred to 'Russia' when really it was the Soviet Union that was meant. The role of the National Geographical Society reflected an institutional dominance in the USA that was not matched in some other countries. Thus, in Britain, the Royal Geographical Society does not try to impose a particular projection

on the British cartographic community.

It was scarcely surprising that American government spokesmen moved from employing maps based on the Van der Grinten projection to those using its Robinson counterpart, rather than the maps devised by the German Marxist Arno Peters. Using an equal-area projection similar to that of Gall, Peters devised his projection in 1967 and presented it to a press conference in Germany in 1973. It was in fact far weaker than many other equal-area maps, because it distorted shape far more seriously, greatly elongating the Tropics, so that, for example, the length, but not the width, of Africa was greatly exaggerated. Coastal shapes were thus considerably distorted and the standard cartographic images of continents, the iconic language of map shapes so important to map-readers, was changed. Distances on the Peters' projection could not be readily employed to plot data.

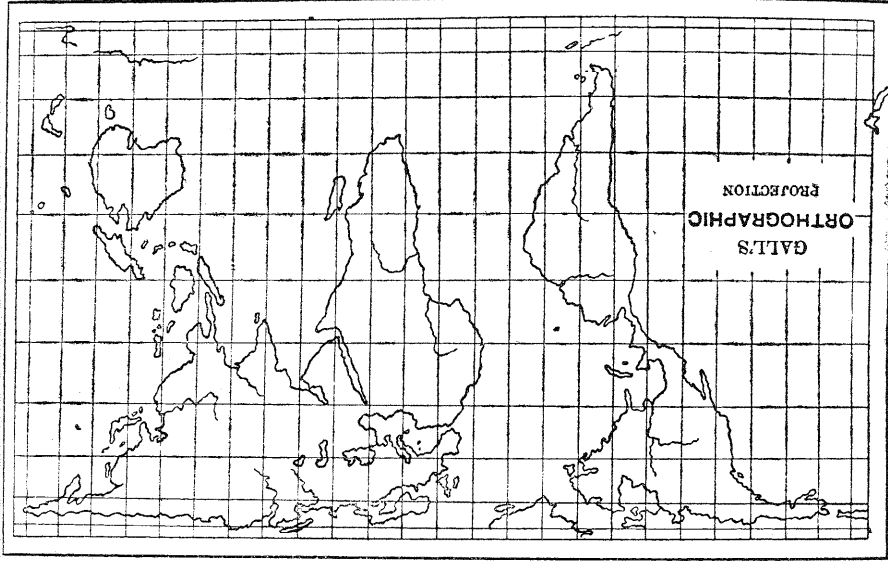
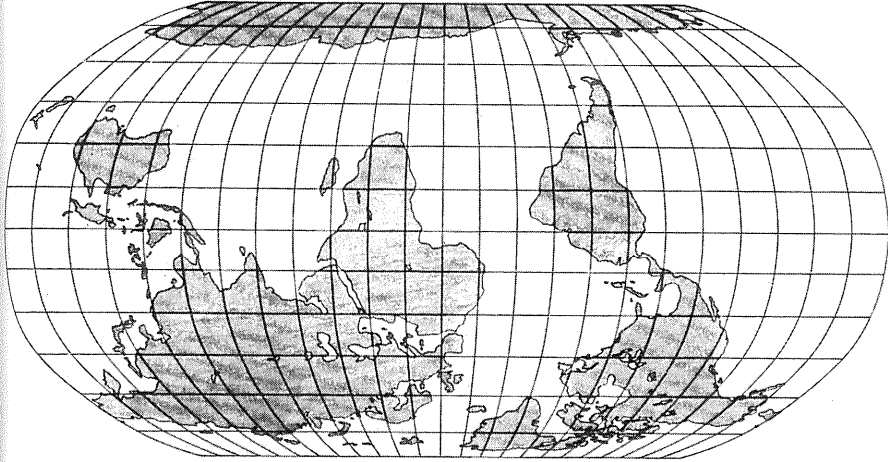


The Goode homolosine projection with interruptions used by Goode to preserve most landmasses uninterrupted, 1925. An equal-area projection that was influential in the USA, thanks to the support of the publishers, Rand McNally.



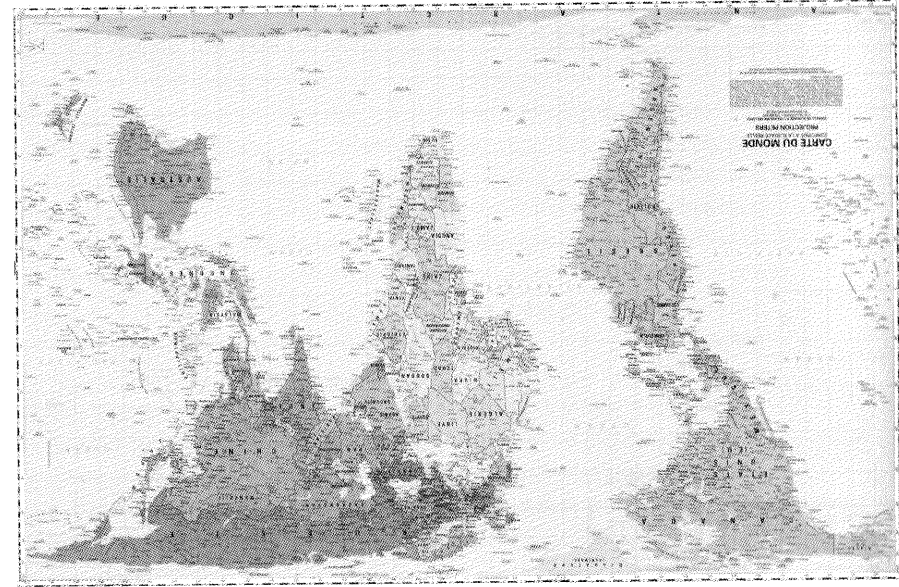
The Van der Grinten projection, invented in 1898. A projection of the world in a circle devised by Alphons J. Van der Grinten. The preservation of the general appearance of the Mercator projection, with a reduced area distortion, satisfied contemporary assumptions of the image of the world.

The Robinson projection, 1963. This was designed to offer the least possible area-scale distortion for major continents in an uninterrupted format map. It avoided exaggerated polar areas. Adopted by the US National Geographical Society in 1988, the projection then became commercially more successful.



The Gall projection, 1855. An equal-area projection devised by the Scottish cleric James Gall. A cylindrical equal-area projection modified to obtain two standard parallels at 45° N and S.

The Peters projection, devised in 1967, embodies the map as redistributive polemic. This projection was employed by Arno Peters as part of a distinct strategy for cartographic re-orientation, in which attention was redirected to regions that he felt had hitherto lacked adequate coverage.



which politics was more than simply a sub-text in projections and, indeed, more generally, in maps. Politically committed and an adept self-publisher, Peters portrayed the world of maps as a choice between his own projection – which he presented as accurate and egalitarian – and the traditional Mercator world view.⁴ Arguing that the end of European colonialism and the advance of modern technology made a new cartography necessary and possible, Peters pressed for a clear, readily understood cartography that was not constrained by scientific cartography and European perceptions. With works such as *Die neue Kartographie/The New Cartography* (Klagenfurt and New York, 1983), published in New York by Friendship Press, Peters struck a chord with a receptive international audience that cared little about cartography, but sought maps to demonstrate the need for a new world order freed from Western conceptions. Peters' emphasis on the Tropics matched concern by and about the Third World, so that his projection was greatly praised by international aid organizations, particularly UNICEF (United Nations Children's Fund), international educational bodies, especially UNESCO (United Nations Educational, Scientific and Cultural Organization), and church bodies concerned with the Third World, such as the Papacy, Christian Aid, the World Council of Churches and the American National Council of Churches.⁵ This was also

financially beneficial: these organizations distributed over 60 million copies of the map and employed it to support their own points about the 'true' nature of the world.⁶ The Peters world map was praised in, and used for the cover of *North-South: A Programme for Survival* (London, 1980): the 'Brandt Report' of the Independent Commission on International Development Issues, a prominent work, which conflated globalist perspectives, social concerns and redistributive strategies. Thus, a cartographic strategy for re-presenting the world was linked directly to the literature of concern and to political and ethical programmes for change. Despite criticisms, the Peters projection continued as a politically correct icon. For example, in 1995 it was used for *The World Map* produced in an English version by Oxford Cartographers for a number of outlets including One Village, The World Shop, Oxford. The map carried the description:

A map which represents countries accurately according to their surface areas. . . . The map may look odd but it is more accurate than most. Maps produced in Europe usually show Europe and the north much larger than they really are – out of scale to the rest of the world. By contrast, this *Peters Projection* shows each country in correct proportion to each other. It is important to get this right, because maps have a profound influence on our understanding of the world around us. . . . Although no conversion of a globe into a flat rectangular shape can be entirely accurate in every way, *Peters* is probably the most accurate and helpful map for today.

The text also included an attack on Mercator, set up as a straw-man alternative to Peters. The same was true of the undated version, also by Oxford Cartographers, sold in 1996 at The Exploratory Hands on Science Centre in Bristol. Its text closed with a section headed 'Fairness to all Peoples':

By setting all countries in their true size and location, this map allows one its actual position in the world. In this complex and interdependent world in which nations now live, the peoples of the world deserve the most accurate possible portrayal of their world. The Peters Map is that map for our day.

Peters used his projection in a thematic global atlas he produced: *The Peters Atlas of the World* (Harlow and New York, 1989 and 1990). All the maps were at the same scale, ensuring that Africa, Asia and South America received more, and Europe and North America less, coverage than in traditional atlases. Thus all areas were to be equal, or, at least, treated equally. The Peters projection, however, is open to serious criticism: it is far less novel than Peters claimed (he underplayed the similarities with Gall), while its shape distortion is serious, especially in the north-south dimension relative to the east-west, in the Tropics and near the Poles, its equal-area basis was challenged, and it was advanced with a dangerous dog-

matism. Novelty, real or apparent, was not the only issue: the rectangular nature of the Peters map, its placing of north at the top and its use of a central meridian close to Greenwich ironically all proclaimed its conventional character.⁷ A Pacific-centred Peters projection was, however, produced, first for a map for Malaysian Airlines published in 1993. Other, less problematic, equal-area projections are available for atlases that wish to emphasize the Third World: Crow and Thomas' *Third World Atlas* (Millon Keynes, 1983) used the Eckert IV projection, which was also used by the *World Bank Atlas* (1980). Atlases have also been produced using projections that give a lower rate of distortion. The *Oxford-Hammond Atlas of the World* (Oxford, 1993) used an optimal-conformal projection for continental land masses that provided a 98 per cent accuracy rate.

It is apparent from the controversy over the Peters map that issues of cartographic choice over projections can be seen as politicized and can lead to political controversies.⁸ This issue can be broadened. The question of 'which way up' the map should be arouses concern, especially in the southern hemisphere. In addition, there is the issue of what the map should be centred on, specifically that of Eurocentricity; ironically, the Peters world map located Europe in the middle of the map, even if Africa is at its centre. The relative role of land and sea also provides an issue for debate. In his *Atlas of the World with Geophysical Boundaries Showing Oceans, Continents and Tectonic Plates in their Entirety* (Philadelphia, 1991), Athelstan Spilhaus emphasized the sea more than other atlases. Spilhaus also challenged the control provided by edges and edging. He mapped what he termed 'a water planet': the world ocean uninterrupted by the edge of the map. To do so, Spilhaus produced a three-lobed map, centring respectively on the Atlantic, Pacific and Indian Oceans, with the map joined around Antarctica.⁹

The notion that Europe should be at the middle of the global map reflected both the role of Europeans in the development of cartography and the imperial power of European states, especially in the nineteenth century. Differently phrased, the notion reflected the dominance of European cartographic ideas, idioms and models. Europe's position was undetermined by the international meeting of 1884, which chose the Greenwich meridian as the zero meridian for time-keeping and for the determination of longitude. This position was challenged, but essentially from within the European world. Thus several American cartographers in the nineteenth century constructed their maps with zero longitude passing through Washington or other American cities, and the notion of an American meridian was seen as a crucial aspect of national self-definition. In 1850, Congress decided that the Naval Observatory should be the off-

This map, a subtle but definite first step, corrects the situation. No longer will the South wallow in a pit of insignificance, carrying the North on its shoulders for little or no recognition of her efforts. Finally South emerges on top. So spread the word. Spread the map! South is superior. South dominates!

Long live AUSTRALIA – RULER OF THE UNIVERSE!!

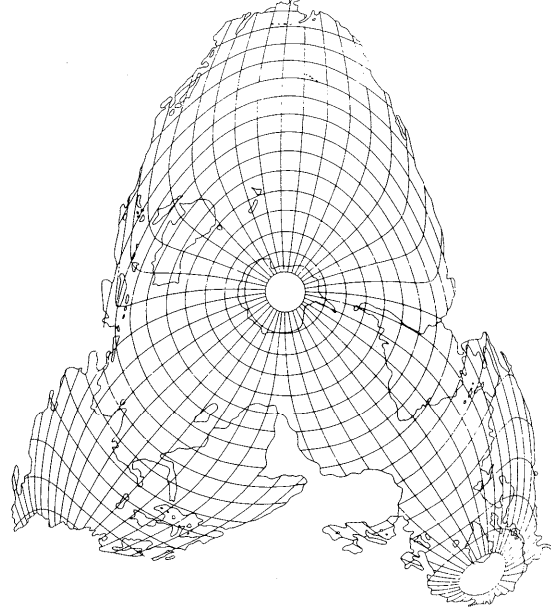
A less ostentatious challenge was that mounted by the growing practice in American atlases from the late nineteenth century of putting the western hemisphere at the centre, rather than on the left side, of the global map, although this location did not become common until the following century:¹¹

To move from maps of the globe to those that are more detailed, it is readily apparent that atlases do not treat all areas of the world's land surface equally, and the same is true of the sea. It is most common for atlases of the world to depict the country, and indeed continent, of publication in greater detail than other countries and continents. As most atlases are published in Europe and North America this leads to those areas generally receiving greater attention. Furthermore, the 'customary' nature of world atlas contents, which critics might prefer to label conservative, ensures that standard assumptions about contents have developed. In spatial terms, these assumptions dictate an intensive treatment of certain regions, especially the USA and western Europe, more specifically the eastern states of the USA and northwestern Europe. By contrast, South America and Africa are treated in far less detail. Whatever the projection, such a coverage violates any notion of equal-area attention.

In addition, the standard pattern of world atlas contents bears little relation to the distribution of population. An atlas that reflected such a relation would devote considerable space to East and South Asia. In fact, such an emphasis cannot be found in atlases of the world. Relative to population, they greatly neglect China, India and, particularly, Indonesia, on the one hand, and exaggerate the importance of Australasia and Canada, on the other. Although to a less marked extent, the USA and western Europe also receive more attention than they merit, certainly in relation to Asia. As the distribution of space in an atlas is an implicit statement of relative importance, these emphases are relevant to the theme of this book, and to the impressions created on readers, but no attention is generally drawn to this issue within individual atlases themselves.

The *Peters Atlas of the World* (Harlow and New York, 1989–90) sought to counter the problem of spatial bias by ensuring that all its maps of parts of the globe appeared on the same scale. However the very use of the Peters projection, and in particular the visual attention devoted to the southern hemisphere, was problematic in demographic terms. Although the verticality of the Peters projection gave considerable prominence to India, while

'Composite Shoreline
Map, emphasizing
the world's oceans.
Athebian Spilhaus
developed a three-
lobed map, with the
lobes centred respect-
ively on the Atlantic,
Pacific and Indian
Oceans. The first
version was devised in
1942; the 1989
version was equal-
area.'



cial prime meridian for the USA, an act not repealed until 1912; and the French did not abandon the Paris meridian until 1911.¹⁰ Even if the map were centred on the Greenwich meridian, understood as representing zero degrees of longitude, the USA would still be in a privileged position, because it is in the 'top left' quadrant of the map, which in Western culture is the customary place to begin scanning or reading a text, the point of origin.

The idea that Europe should be at the middle of the global map and the northern hemisphere at the top, with all the positive connotations implied by that double positioning, has been challenged by a number of maps. One of the most dramatic is *McArthur's Universal Corrective Map of the World*, distributed by Rex Publications (Atraron, New South Wales, 1979). Australia is in the middle of the map and the southern hemisphere on top. The tone of the text is combative, but its very extremism reveals it as likely to make little impact, and possibly this was appreciated by the compiler:

At last, the first move has been made – the first step in the long overdue crusade to elevate our glorious but neglected nation from the gloomy depths of anonymity in the world power struggle to its rightful position – lowering over its Northern neighbours, reigning splendidly at the helm of the universe. Never again to suffer the perpetual onslaught of 'downlander' jokes – implications from Northern nations that the height of a country's prestige is determined by its equivalent spatial location on a conventional map of the world.

insurance maps and atlases for about 12,000 American towns published from 1867 by the D.A. Sanborn National Insurance Bureau.

Poverty and the poor continue to receive a relatively small share of cartographic attention. Alongside the large number of modern maps produced by developers and estate agents detailing or depicting choice housing developments, their location and layout, it is unusual to find a work such as R.C. Prentice and G.B. Lewis' *Atlas of Housing Conditions in Welsh Districts* (Swansea, 1988). Its very format and appearance, and its publisher – the Housing Centre Trust, South Wales Branch – reflected a limited availability of funds and restricted marketing support. Golf courses are better mapped than poverty, although they are also of course easier to map, and it is more necessary to do so for the purposes of planning and play.

A Western primacy is an accurate reflection of the world in one respect, in that it is a response to the distribution of per capita economic, and therefore atlas-purchasing, power. Maps and atlases are overwhelmingly purchased in the West and the profit margins on their sales are also greater there. This can be readily seen with the pricing of individual atlases sold in different countries: titles sold in Africa, for example, have to be priced lower than in Britain. Thus the Eurocentricity, understood to include North America, of atlases in part reflects what sells or is believed to sell most copies. Atlases with different priorities frequently require subsidy; consequently, Spilhaus' *Atlas of the World With Geophysical Boundaries* (Philadelphia, 1991) was published by the American Philosophical Society. Yet such subsidies are most readily available in the West.

Atlases reflect commercial pressures in other ways. The need for international sales, in order to recoup the high cost of production and to maximize profits, encourages publication in English, or another major international language: French or Spanish. Although atlases are translated for particular national markets, the language of first production or principal edition is of great importance as it conditions the place names used, and the space available for keys and captions. In addition, even though the titles and captions of maps, and the accompanying text, can all be translated, their contents are affected by the suppositions associated with the terms used in the original language of the atlas, as well as by the cultural suppositions of the people employing that language.

Nomenclature is an important issue, not least as formerly colonized areas seek to remove the linguistic impact of European imperial rule. This creates problems for cartographers. Readers outside India wish to find Bombay, Delhi and Madras, not Mumbai, Dilli and Chinnai. Renaming is not simply directed against European imperial powers; it also seeks to reposition history, to make it truly past. For example, in 1996, the Hindu fundamentalist Shiv Sena government in Bombay/Mumbai wished to change the name of Aurangabad, a city named after the seventeenth-century Moslem Mughal Emperor Aurangzeb, and to call it Sambhaji Nagar, to honour a Hindu opponent of the Mughals. Thus, for a cartographer, remaining can be more directly political than the more general removal of European colonial accretions. It can relate to indigenous, or at least non-European, political projects, past or present, concerning which it can be difficult for a cartographer to show sufficient sensitivity and adequate judgment.

The West is not only dominant in the commercial world of map-making, but also in that of state production, subsidy and distribution. The two are linked and, indeed, it is in part access to the opportunities of the commercial market that gives certain government cartographic agencies a particular edge. Such links are not new. From 1823, the extensive range of charts produced by the British Admiralty was offered publicly for sale in Britain. Mapping projects and institutions receive far greater public subsidies in the 'Third' World, such that both public and private sources of largesse and provision of opportunity are combined in one part of the world.

The modern role of satellite location-finding has given some government agencies an additional importance. The US Department of Defence developed a global positioning system (GPS) that depended on satellites. This was made available to civilians, but the accuracy of the signal was degraded by a process known as Selective Availability, so that positions thus obtained would be accurate to within 100 metres only 95 per cent of the time. Were this degrading not employed, the civilian signals would be generally accurate to within 15 metres. The technology is Western, and access to it requires an ability to afford, to understand and a wish to locate oneself with reference to 'Western' technology.

Criticism of Eurocentricity has come both from within and from outside the West. Some Western map-makers have cast a critical eye on the suppositions underlying, and contents of, earlier atlases. A different cartography was offered from the 1920s by Marxists. This was true both of the maps produced in Communist states and of those produced by sympathizers elsewhere, for example John Horrabin in Britain. Marxist maps focused on issues of political and economic power in a manner that sought to draw out the implications of such power. For example, the economic links of colonial systems were presented in terms of imperialist exploitation. Similarly, in Marxist maps there was a focus on opposition to established power, both in colonial systems and in capitalist states, although their Communist counterparts were not exposed to such cartographic scrutiny.

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More recent revisionism can be found across the range of atlas and map production, from works for children to academic atlases. Thus, Antony Mason, in *The Children's Atlas of Exploration* (London, 1993), responded to the controversy about Columbus excited by the cinquecentennial of his first voyage to the 'New World'. Mason discussed non-European ex-

plorers, and wrote of Columbus that he found places about which he – and the rest of Europe – previously knew nothing. It was a discovery only from the European point of view. The fact that he went on to rename many of the islands, and to claim them for Spain, was typical of the behaviour of European explorers during the fifteenth and sixteenth centuries. Such arrogance and aggression has given the term 'discovery' a bad name.

Instead, Mason proposed a pluralistic and relativistic interpretation. He argued that 'the world is a jigsaw puzzle', a thesis illustrated in his atlas by a globe thus presented, and continued:

Each community in the world builds up its own knowledge about the world. For example, a European's understanding of the world is quite different from that of a Tuareg nomad in the Sahara Desert. We cannot say that one is better than the other. The Tuaregs' knowledge of the Sahara is far more useful to them than the European's idea of the world would be.¹²

This relativism was and is linked to a clear and open desire to redress past wrongs, to correct a cartographical inheritance seen as flawed.

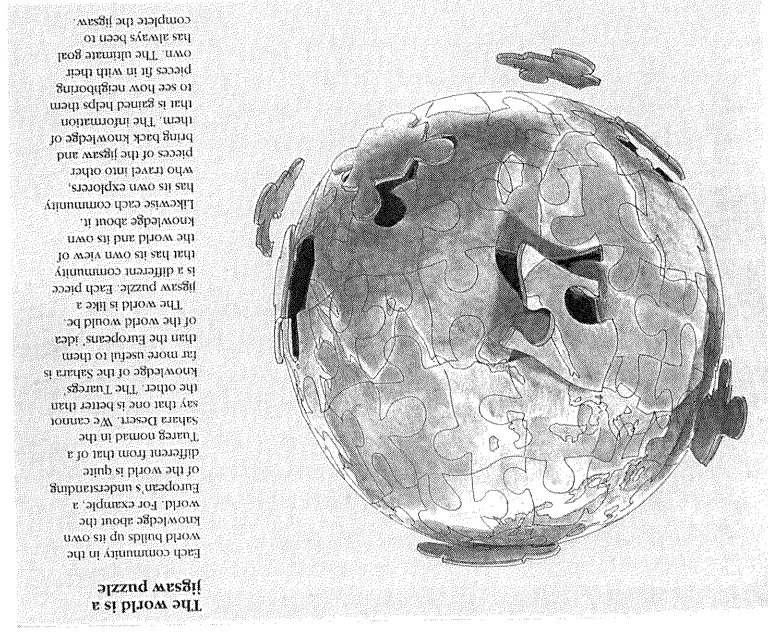
In terms of maps, this emphasis is seen not only in a desire to increase the coverage of non-Western countries and peoples, but also to present them – in their present and their past – without concentrating on links with the West. This serves the purpose both of presenting a past and a present that are not primarily responsive to the impact of the West, and also of showing how they can be presented with minimal reference to the West.

At the academic level, this approach can be seen in a number of works. Thus Joseph Schwartzberg, the editor of the best atlas of South Asian history, wrote that

A final aim of this atlas is to contribute in modest measure to redressing a conspicuous imbalance in the presentation of South Asian history, which, despite the recent growth and vigour of the historical profession within the region, remains excessively preoccupied, in our judgment, with the impact of the West on South Asia and with the roles played by specific Westerners. As a simple illustration of a corrective, to be found nowhere else, we cite our map of 'Centers of South Asian Religious Movements Abroad'. Maps of Western missionary activity in India, by contrast, can be found in abundance.¹³

For atlases of the modern world, such an approach, for example, suggests the abandonment of the depiction of shipping routes, which were in many respects a European way of organizing and making sense of space: this was

The Globe as Jigsaw, from Antony Mason's *Children's Atlas of Exploration* (1993). Mason's presentation of the globe was designed to demonstrate the separate spatial understandings that co-existed in the world.



A growing concern about Eurocentricity has also been related to greater interest in indigenous peoples, their current interests and culture, and the way in which their cartographic traditions have been ignored. This interest has been particularly marked in areas of British and British-related colonial activity, especially the USA, Canada, Australia and New Zealand. In the first, a number of atlases devoted to particular Native American tribes appeared, for example J.M. Goodman's *The Navajo Atlas* (Norman, 1982) and J.J. Ferguson and E.R. Hart's *Zuni Atlas* (Norman, 1985). Both were published by the University of Oklahoma Press and were evidence of the

importance in the New World. Furthermore, the ethnic impact of European colonialization was very important in the New World. Further, the ethnic impact of European colonialization was very important in the New World. Further, the ethnic impact of European colonialization was very important in the New World. Further, the ethnic impact of European colonialization was very important in the New World.

commercial possibilities of their subjects and, more generally, of American

academic, popular and institutional interest in Native Americans. They presented a favourable view of their subjects, seen as essentially in accord with the environment and thus a ready contrast to the impression presented of European Americans; Native Americans were also generally presented as victims of European colonialization.

The two views were linked. If native peoples had a symbiotic relationship with the environment, they could not be seen as in some way having failed to develop its potential. The latter attitude had served to justify conquest and expropriation in the nineteenth century, an attitude given cartographic form by the association of European control with settled agriculture, while, in terms of land use, indigenous peoples were generally associated with what were presented as less intensive, and thus less valuable, practices. Expropriation was thus justified in order to permit exploitation: the latter was the necessary end of the human relationship with the Earth and one that was facilitated by the surveying of its riches. Maps thus assisted the utilization of resources; they were a natural corollary of the discovery of spaces and routes.

In the late twentieth century, there has been a major shift in consciousness. In Australia and Canada, indigenous peoples have recently been allocated a relatively large share in national atlases. Thus, *Australians: A Historical Atlas*, edited by J.R. Cram and J. McQuilton (Broadway, 1987), and the nearest the Australians get to an authoritative national historical atlas, devoted more weight to indigenous peoples than earlier national atlases of those states, and did so in a more sympathetic fashion.

Greater emphasis on indigenous peoples was not simply a matter of devoting more space to them; there was also a major effort to understand their notions of space and mapping. This is true both of historic cartography, most obviously with the impressive and influential *History of Cartography* volumes edited by Brian Harley and David Woodward (Chicago, 1987-), and of discussions of current indigenous traditions. Both produce accounts of space and spatiality that are very different from modern Western notions, and, at times, these have been contrasted, throwing light on different spatial conceptions and cartographic realizations. Thus, in his *Le Carrefour japonais: Essai d'histoire globale* (Paris, 1990), Denys Lombard made both Dutch mapping of Java, their most important colony, and local views relative.

A focus on non-Western traditions of conceiving of and depicting space has generally been accompanied by a sense that Western interpretations were and are, at best, one among many and, at worse, heavily flawed and compromised by the Western intellectual and political tradition; more

particularly, by the cult of science, a view of the environment as a sphere for control, and colonialism. To a certain extent, this approach is not very helpful, as it is not a case of comparing similar cartographies.

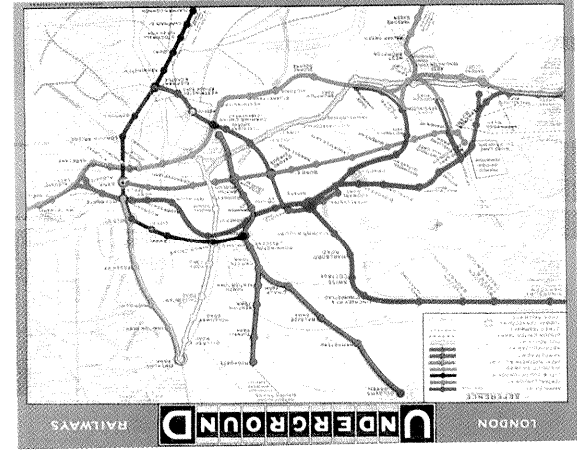
For example, the secularization of most knowledge occurred earlier in the West than in other cultures. This can be seen as a weakness, inhibiting holistic understandings of life and the environment. Much, although by no means all, historic non-Western cartography was in part religious. It often focused on cosmology, as for example in India, or on attempts to make sense of the human environment in terms of the movements and activities of spirits, especially ancestors, as for example with the Aborigines of Australia, the Maoris of New Zealand and the native population in New Caledonia.

Such a sense of space was and is potent, not least because it includes time, offering a congruence of time and space, a four-dimensionality, giving strong meanings to landscapes. It is also arguable that indigenous senses of space were and remain potent because they have direct meaning for the people concerned. They are not abstracted from their experience by a process of cartographic professionalism, of specialized production and depiction; although it is unclear how far such indigenous senses of space can be presented as egalitarian. A romanticization of indigenous cartographic imagination may be inappropriate, as it neglects the social configuration of knowledge, access to it and power within such societies.

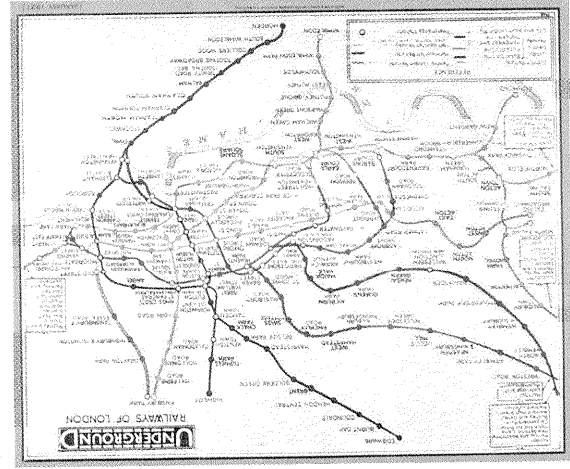
Westernization has certainly splintered the cartographic perception of non-Western peoples. In modern times there can be a difference between the representation of spatial views of the world (often religious and cosmological) and the view of geography that would be produced by non-Western peoples who have command of Western cartographic techniques. Westernization was not dependent on colonial control. Although Ethiopia was only briefly conquered by a European power, its maps reflect the imprint of Western patterns. The period of maximum Ethiopian political reaction against the West this century also saw the production of the *National Atlas of Ethiopia* (Addis Ababa, 1988), a work produced by the Ethiopian Mapping Authority, which was strident in its ideology, yet unsurprising in its cartography.

Aside from indigenous peoples being seen as relics, resisters and victims of colonialism, there is the more general problem of the mapping of ethnicity. This is a politically charged issue, not simply because of issues of ethnicity within states, but also because the notion of the nation-state, as the most legitimate form of political organization, has necessarily directed attention to ethnic boundaries and their mapping.

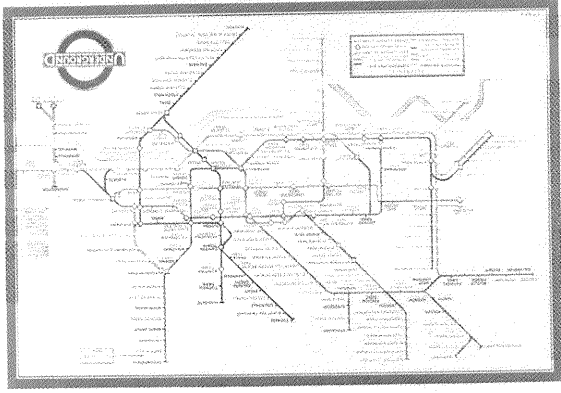
Race, a categorization based on physical characteristics, is notoriously difficult to define; religion and language are more straightforward,



The first London Underground Railways map, issued free in 1863. An accurate reproduction in which lines were related to a central London map.



The 1927 London Underground map designed by F. H. Stimson. This map recorded the expansion of the network into the suburbs.



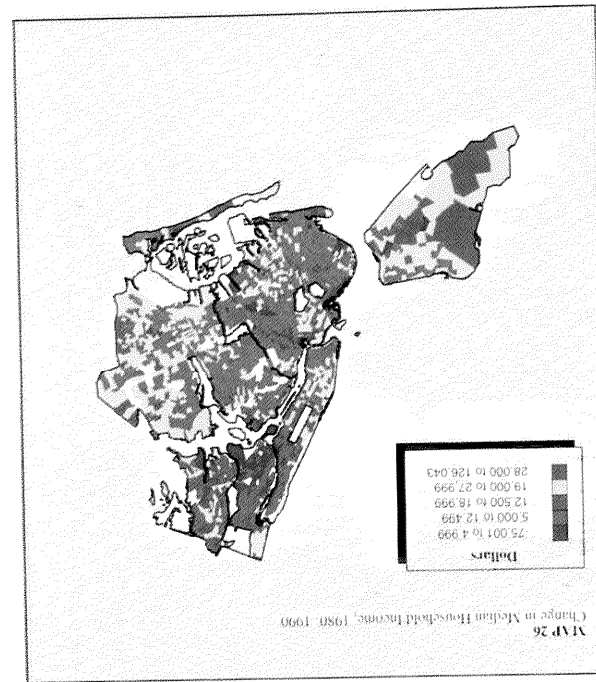
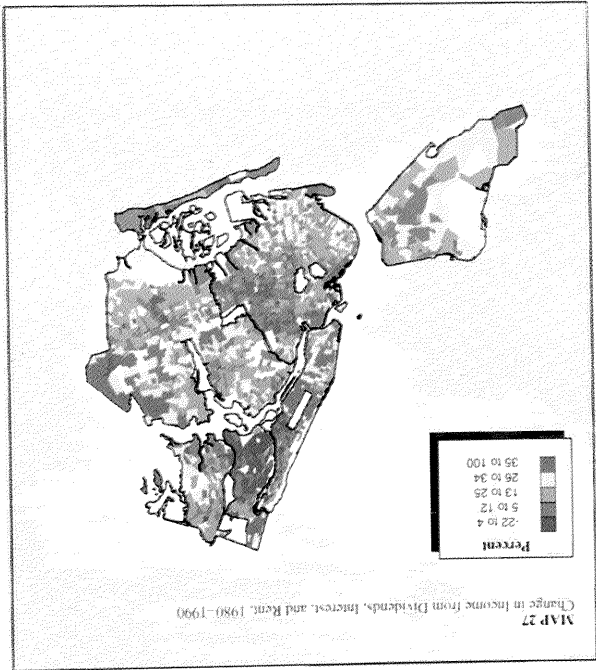
The 1933 Underground map by Harry Beck. A diagrammatic approach that offered clarity rather than a close relationship to actual directions and locations.

although they still pose important problems and are politically contentious. Ethnicity draws on all three categories, not least because of the role of image and self-image in definition. Thus an ethnic group generally has a common language or religious tradition, and these are important to its shared culture and traditions and to their distinctive nature. Ethnicity is no longer a factor in nationality in most countries, although there are important exceptions, not least in 'liberal' states, as Turks in Germany are aware, while political culture and practice may be such that enjoyment of the full benefits of nationality is indeed related to ethnic considerations.

Race, ethnicity, religion and language are frequently discussed and applied as if they were precise. This was, and is, far from the case. All of them are problematic as systems of classification and thus, even if relevant data can be established and plotted precisely, mapping is far from simple and involves choices that will be contentious and can be seen as political. 'Breed' as a categorization has even more unfortunate connotations. To take race, which is an attempt to apply to humans a taxonomic classification below the level of species, any definition encounters problems: no race possesses a discrete package of genetic characteristics; there are more genetic variations within than between races; and the genes responsible for morphological features, such as skin colour, are atypical.¹⁴

These scientific issues interact with institutional practices. The systems of classification used for race vary, not least in the treatment of bi-racial marriages and of mixed-race people. The practice of such marriages and unions helps to undermine the very fluidity of the situation: unless entrenched through endogamy, demography undermines racial classification and thus racial mapping. As a consequence, whichever concepts are employed in the classification and mapping of race, there are major problems with the consistency of the data. Races are constructed as much as described, and mapping plays a role in such construction.

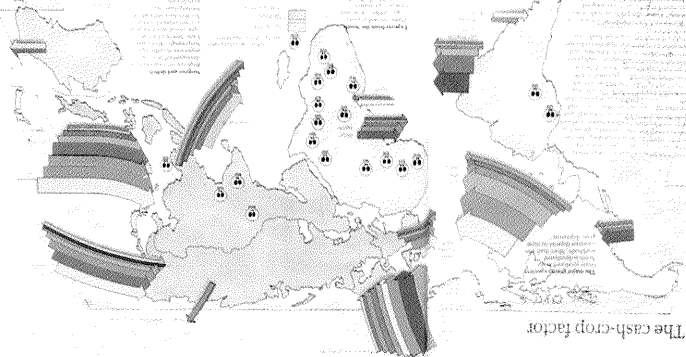
Given that the definitions of race and ethnicity are fluid and contested, it is scarcely surprising that mapping them is problematic. This is especially so because a frequent practice in such mapping is to produce homogeneous blocs of colour separated by clear boundaries. In short, in many maps, race, like language and religion, is treated as a creator of clear-cut units that are as readily apparent in maps as states. An equivalence between the two is asserted by means of using a similar cartographic language. Such a process then encourages a sense on the part of the average map-user, if such a term can be used, that the boundaries ought to correspond, and that, if they do not, there is a clear anomaly. This approach was used by nationalist polemicists, for example protagonists for the creation of nation-states or for territorial gains by existing states, in Europe in the late nineteenth and early twentieth centuries. It is



Opposite below 'The Cash-Crop Factor from *The Gata Atlas of Planet Management*. A presentation of the global economy that emphasizes the problems arising from the export of agricultural produce. The use of death's heads dramatizes the issue, but does not add to the analysis.

Right Change in Median Household Income, 1980-1990, from John Mollenkopf's *New York City in the 1980s: A Social, Economic and Political Atlas* (1993). A very different account of the city than that provided by a road map.

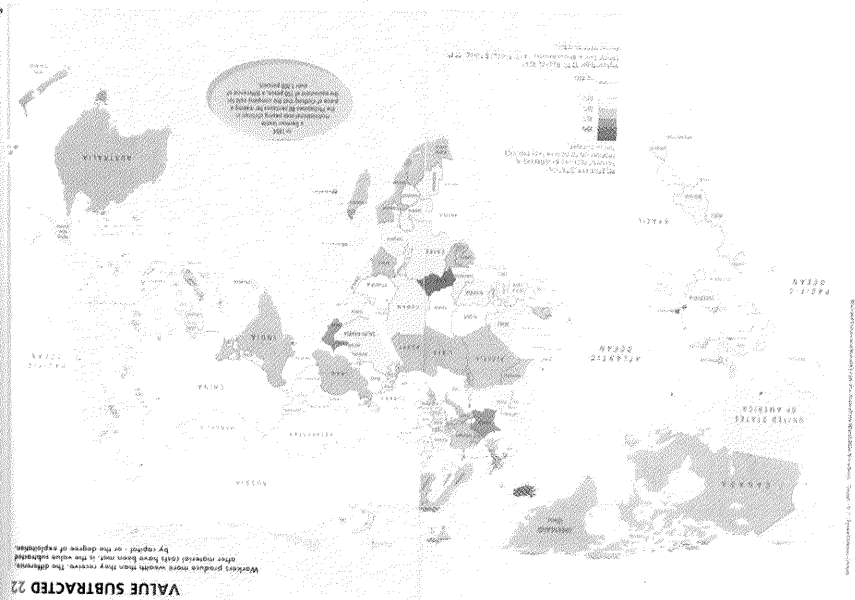
Below right Changes in 'unearned' income, 1980-1990, from Mollenkopf's *New York City in the 1980s*. The financial benefits of the decade were concentrated in white upper-middle-class areas. Dividends, interest and rent as a spatial indicator of class society.



MANAGING THE LAND

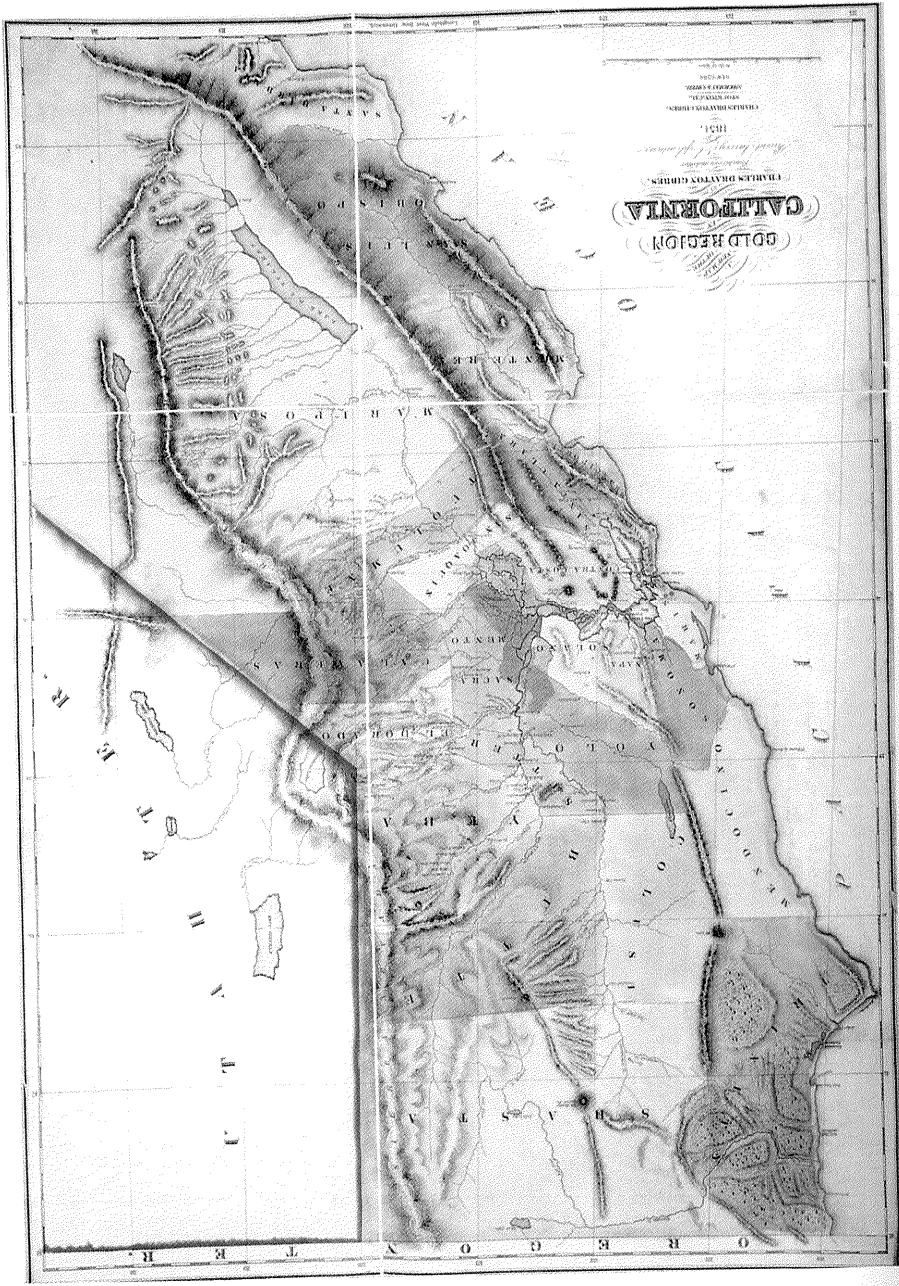
1981-1990, 1991-1990

'Value Subtracted'. A tendentious mapping of relative exploitation from Michael Kidron and Ronald Segal's *State of the World Atlas* (1995). A crude but vigorous map in an atlas characterized by hostility to capitalism.

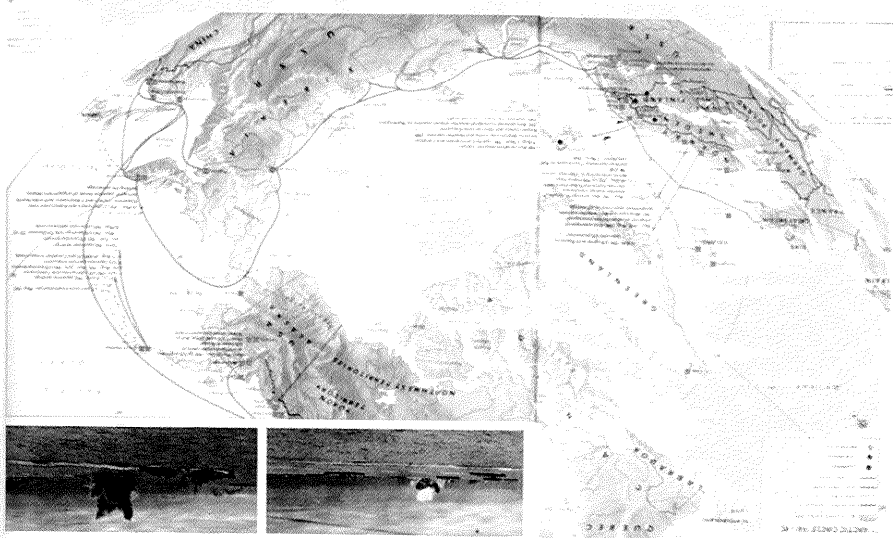
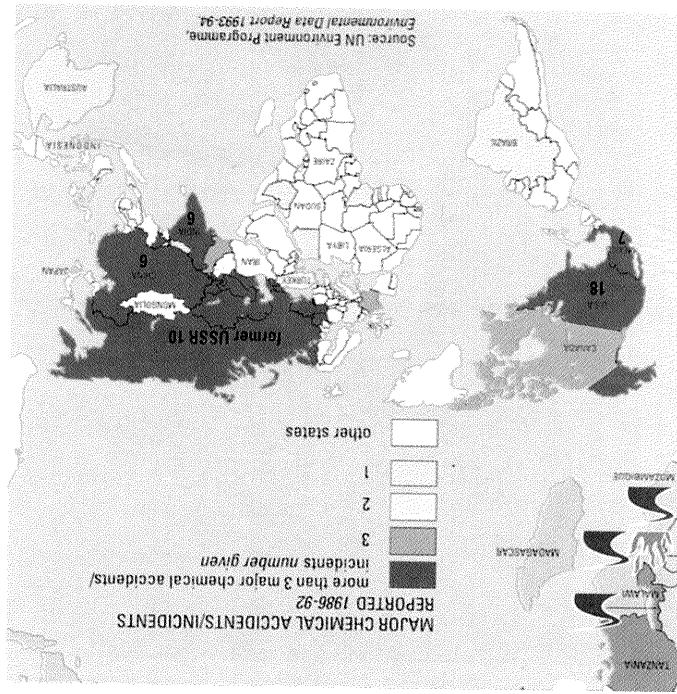


Workers produce more wealth than they receive. The difference is the surplus value. The shaded areas represent the degree of exploitation.

A New Map of the Gold Region in California by Charles Drayton Gibbs (1851) was an example of the use of the map in order to assist exploitation. The native population was ignored.



'Major Chemical Incidents/Accidents from Kidron and Segal's State of the World Atlas. The use of red is intended to dramatize the extent of the problem, but 'major' is a subjective term and there is no indication of the relationship between accidents and total activity.

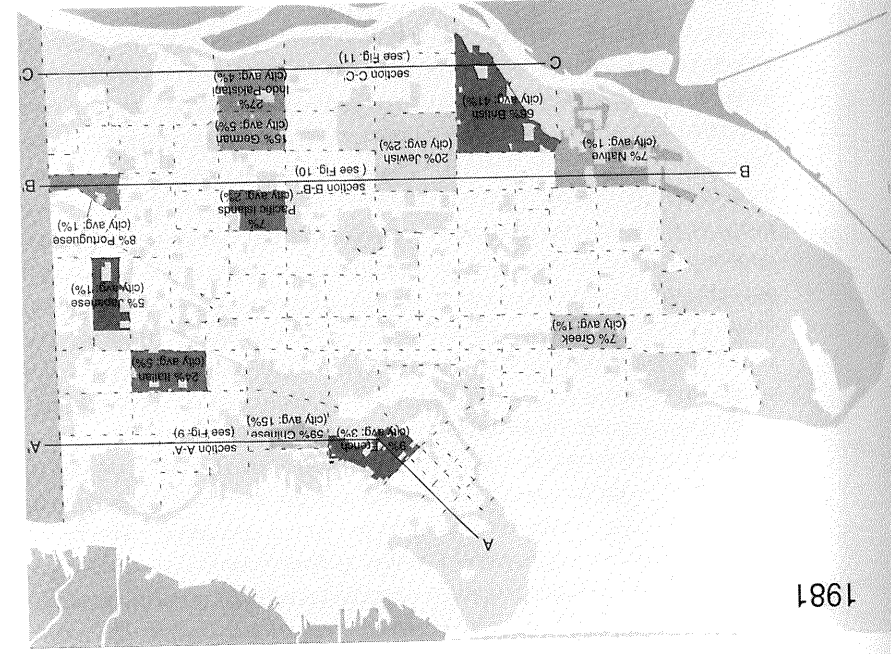


War in the Arctic Circle from John Keegan (ed.), *The Times Atlas of the Second World War* (1989) directs attention to a region that is generally ignored in the mapping of the war and adopts a projection that links conflicts in the northern Pacific and off Norway. It fails to point out however that Japan and the USSR were not at war.

South Africa, the fundamental issue in the mapping was a concentration differences in the accuracy of census data between ethnic groups in especially squatter settlements, but this was not the major issue. As with Africa. In part, this reflected the difficulties of mapping such settlements, and squatter settlements, were ignored or minimized on maps of South Africa.¹⁵ Numerous substantial Black settlements, particularly townships and squatter settlements, were particularly the apartheid regime in South Africa. This was particularly the case during the apartheid regime in South Africa. This was particularly the case during the apartheid regime in South Africa. This was particularly the case during the apartheid regime in South Africa.

Homogeneity is generally implied by displaying or ignoring minority communities, but in some cases it entails doing so to the majority community. Homogeneity is generally implied by displaying or ignoring minority communities, but in some cases it entails doing so to the majority community. Homogeneity is generally implied by displaying or ignoring minority communities, but in some cases it entails doing so to the majority community.

Mapping Ethnicity. Largest ethnic origin group by census tract, 1981, from Bruce Macdonald's *Vancover: A Visual History* (1992). A mapping of ethnic concentration that indicated where each major ethnic group was most concentrated, but without suggesting that this led to homogeneous blocs.



1981



Britany, from the Michelin Carte Routière and Touristique series. A region known best for its coastline presented with an emphasis on the major road routes. Colour provides a hierarchy, emphasizing major roads, while railways are less prominent. The Michelin series integrates France: different environments are made familiar by the employment of the same cartographic conventions and symbols, and there is no allowance for Breton or Corsican nationalism.

on the White population. Thus, in maps, small White-dominated towns, especially in rural areas, were given a misleading prominence. Mapping techniques, such as unit-dot maps or the employment of interdigitated diagonal bands of different colours, exist to display heterogeneity, and to create an impression of a nuanced reality, a spatiality of emphasis not consistency, but they are generally not used. One possibility is the use of highest ethnic concentrations by census tract, as in *Vancouver: A Visual History* (Vancouver, 1992). This mapped the single highest density of each ethnic group that made up more than 5 per cent of a census tract's population. The percentages given in brackets, showing the percentage of each group over the whole city, served to indicate the degree of concentration or assimilation of each group shown on the map when they are compared with the percentages of the densest area. New groups, visible minority groups, and groups retaining the culture of their home country, for example the Chinese, show a tendency to congregate, while for ethnic groups that have assimilated, such as the Germans, the data has less meaning. The value of such mapping is that it does not suggest the existence of homogeneous blocs. Unit-dot maps, where one dot represents a fixed quantity and demographic diversity is shown by having different coloured dots on the same map, are very confusing, but this very confusion is instructive; it is an accurate reflection of the reality of racial, ethnic, religious or linguistic diversity. The use, instead, of homogeneous blocs is misleading. Given the role of religion, race and language in reflecting and fostering division, the dominant current pattern of mapping these subjects is unfortunate.

Any apparently homogeneous territorial space is problematized if attention is devoted to its internal differences. Traditionally, a major division in the mapping of the globe, continents, countries or smaller areas, as seen particularly in atlases, has been between maps of political or administrative boundaries and maps concentrating on the physical geography of the area in question. The latter, of course, emphasize difference, particularly of height, but the differences appear 'natural', not controversial.

In fact, there are issues of choice involved in presenting physical geography, and the controversies about these choices can be politicized. A choice of contour intervals and shading and an emphasis on peaks that present a country as mountainous makes a different statement about it than one that minimizes the impression. Similarly, there is no clear standard by which to establish the number of rivers that should be shown on a map or the quantity of marshland. Again, to emphasize either, for example by mapping all rivers above a certain length, width or average flow, or by mapping tributaries, and often minor ones, alongside mighty rivers, creates an impression that triggers the connotations associated with riverine or marshy character.

Thus the *Times Atlas of the World* (London, 1968) was assiduous in indicating marshland; indeed, the key included separate symbols for 'saline marsh', 'marsh, swamp, flood-area, and mangrove swamp'. As a consequence, areas such as the Guadalquivir Valley below Seville, the Costa Blanca south of Alicante or the Atlantic coast of Iberia between Faro and Huelva appear very different from their depiction in atlases of the period that ignore or minimize marshes.

It is also difficult to assign meaning to 'physical geography' where there has been human interference, as in the damming of rivers, the conversion of lakes to reservoirs, reclamation from the sea, and the drainage of marsh-lands. Nevertheless, physical geography is commonly seen as akin to organic. Thus, for example, maps and supporting text can emphasize that surface features reflect geology. This contributes to a situation in which there also appears to be a flow of influence from physical to non-

The physical world